Status of the Claims

Claims 1 – 36 remain pending in the application. Claim 22 has been amended to correct a typographical error that caused part of the preamble to be omitted (see Claim 16).

Specification

The Examiner noted that on page 9, line 5, the acronym "VLCs" is used and suggests that applicants spell out all first instances of all acronyms for clarification. However, applicants did identify the acronym "VLC" as corresponding to variable length coding on page 8, line 30 of the specification.

Claims Rejected under 35 U.S.C. § 112, Second Paragraph

The Examiner has rejected Claims 1 – 36 under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded by applicants as their invention. Specifically, the Examiner objects to the use by applicants of the words "perceptually" and "subsequently" in independent claims 1, 16, 22, and 29 for failing to "specify a definite limitation for the claims." Applicants respectfully disagree for the following reasons.

The term "perceptual" is defined in regard to a "perceptual signal" on page 4, lines 4 – 6: "*a specific type of input signal and refers specifically to a signal that includes audio and/or video data, i.e., data that can be used to produce audible sound and/or a visual display.*" On page 13, lines 25 – 34, the specification of the present application further explains the meaning of "perceptual relevance" as follows.

> It must be emphasized that the present invention is applicable to almost any type of signal that does not require retention of all of the data conveyed by the signal. For example, the present invention can be applied to video data, since *perceptually less important* data can be omitted from the signal recovered from data packets formed in accord with the present invention. The present invention is particularly applicable to forming data packets of *perceptual data*, since the effects on a signal produced using data packets from which less important data have been truncated by the present invention is generally very acceptable *when aurally and/or visually perceived by a user*. (Emphasis added.)

In combination with the specific definition provided by applicants for "perceptual signal," the above quote makes it clear that "perceptually less important" in connection with a signal relates to the aural and/or visual perception of the signal by a user, i.e., truncation of such perceptually less

important data packets from a signal does not adversely impact the perception of the signal by a user. Conversely, it should be apparent that "perceptually more important" refers to data in a signal that is important and is retained to benefit the aural and/or visual perception of that data by a user. Throughout the specification, applicants have explained the relevance of signal processing in relationship to the *perceptual* quality of the signal that is thus produced. Accordingly, the use of the term "perceptually" in the claims is not unclear and does not justify a rejection of the claims under 35 U.S.C. § 112, second paragraph.

More importantly, the use of the term "perceptually" is common in this art and is readily understood by those of ordinary skill. Enclosed herewith is a copy of an exemplary technical paper that relates to signal processing and which demonstrates that the term "perceptually" is commonly used by those of ordinary skill. [Note that this paper is not believed to be material or relevant to the patentability of the claims in the present application, and thus, is not being cited in an Information Disclosure Statement, but instead, is provided simply as evidence that the term "perceptually" is well know in the art of signal processing.]

The paper, by T. Painter and A. Spanias, "Perceptual Segmentation and Component Selection in Compact Sinusoidal Representations of Audio," Proceedings of the IEEE Volume 88, Issue 4, April 2000 Pages: 451 – 515, Digital Object Identifier 10.1109/5.842996, uses "perceptually" nine times. For example, in the middle of the first paragraph, second column, second page, the article states: "It was shown that the transient processor is able to identify the *most perceptually significant* transients, and that the scheme provides a natural scaling mechanism for low rate applications." (Emphasis added.) The Examiner is invited to scan the article to identify the other instances in which "perceptually" is used.

There are many other references in this art that use the term "perceptually," and at least a few of these references can readily be identified by making a search on the Internet. Accordingly, it will be evident that the term "perceptually" used in applicants' claim, will readily be understood by one of ordinary skill in the art, both because of the definition and disclosure provided by applicants' specification and because the term is commonly used in this technology.

The Examiner also objects to the use of the term "subsequently" in the claims. However, the normal meaning of the term "subsequently" applies to its use in the claims and this meaning is not unclear. For example, in Claim 1, step (d)(ii), applicants recite, "so that the coefficients that are less

perceptually relevant can subsequently be truncated from the data packet." This term could be replaced with the synonym "later," but there is no reason to amend the claim in this manner, since the meaning of the phrase in which "subsequently" appears is clear on its face. Webster's online dictionary (at http://www.webster-dictionary.net) defines the word subsequently as "at a later time; afterwards." Thus, it will be apparent that the step quoted above simply means that coefficients that are less perceptually relevant can be truncated from the data packet at a later time. Accordingly, the term "subsequently" is not unclear.

Since both of the terms "perceptually" and "subsequently" have been shown not to be unclear, the Examiner is asked to withdraw the rejection of all of the claims under 35 U.S.C. § 112, second paragraph.

Claims Rejected under 35 U.S.C. § 102(b)

The Examiner has rejected Claims 1 and 13 as being anticipated by U.S. Patent No. 5,303,058 (Fukuda et al. – hereinafter referred to as "Fukuda"). The Examiner takes the position that Fukuda discloses each step of Claim 1 and cites to various portions of Fukuda in support of the rejection. Applicants respectfully disagree with the Examiner for the following reasons.

The Examiner cites col. 1, lines 38-45, and col. 2, lines 3-14 of Fukuda as anticipating step (a) of Claim 1, which recites "implementing a two-dimensional transform of the signal, producing a transform matrix having ***modulation frequency*** as one dimension," (emphasis added). However, in reviewing the cited portion of Fukuda, it is apparent that Fukuda does not produce or use a transform matrix having *modulation frequency* as one dimension. Instead, col. 1, lines 38-45 of Fukuda refer to a prior art approach for performing a two-dimensional discrete cosine transform (DCT) that is transformed into a matrix of DCT coefficients "corresponding to respective space frequency distributions." Lines 3-14 of col. 2 in Fukuda refer to FIG. 6 and teach scanning a quantized coefficient matrix D_{QU} according to a zig-zag scan order to rearrange the two-dimensionally arrayed elements into a one-dimensional array. However, Fukuda does not teach or suggest a two-dimensional transform to produce a matrix with "modulation frequency as one dimension," as recited in step (a) of Claim 1. Fukuda does not include any provision for modulation detection and thus, could not use such a matrix. Accordingly, Fukuda does not anticipate step (a) of the claim.

In regard to step (b) of Claim 1, the Examiner cites col. 2, lines 25-28 of Fukuda. Step (b) recites, "*reducing a **dynamic range** of the signal*" (emphasis added). In contrast, Fukuda teaches a

coder 31 that "reduces the *volume of data* necessary for expressing the quantized coefficient matrix D_{QU}." Clearly, reducing the dynamic range of a signal is NOT equivalent to reducing the volume of data, since reducing the volume of data would refer, for example, to eliminating data packets, which is not at all related to reducing a dynamic range of data. Reducing dynamic range refers, for example, to compressing a loudness range of an audio signal, which is not done by eliminating data to reduce the volume of data. Accordingly, Fukuda does not teach or suggest step (b) of Claim 1.

Step (d) recites, "producing data packets in which the coefficients that have been selected are encoded based upon a desired order of the coefficients, with coefficients that are more perceptually relevant being used first to fill each data packet and coefficients that are less perceptually relevant being handled in one of the following ways." The Examiner cites col. 2, lines 3-14 of Fukuda as disclosing this step. However, as noted above, this portion of Fukuda teaches a zig-zag scan of the quantized coefficient matrix, producing a one-dimensional matrix with the DC element at the head end followed by the AC elements having lower space frequencies. No mention is made by Fukuda of "perceptually relevant" as a basis for ordering coefficients in a matrix. Accordingly, there is simply no basis for the Examiner to assert that Fukuda teaches this aspect of applicants' claim recitation. Similarly, contrary to the Examiner's assertion, col. 2, lines 54-64, col. 5, lines 29-40, and col. 6, lines 10-18 of Fukuda fail to teach or suggest substeps (i) and (ii) of step (d) in Claim 1. Substep (i) provides that the coefficients that are less perceptually relevant are discarded once an available space in each data packet that is to be stored or transmitted has been filled with the coefficients that are more perceptually relevant. Substep (ii) provides that the data packets that are less perceptually relevant are disposed last within each data packet, so that the coefficients that are less perceptually relevant can subsequently be truncated from the data packet. Since Fukuda is not concerned with the perceptual relevance of coefficients, it is not surprising that this cited art fails to teach or suggest these substeps or any equivalents thereof. Instead, Fukuda teaches ordering the quantized coefficients based on their magnitude (i.e., their "significance" as taught by Fukuda). This ordering is not related to perceptual relevance, however. Accordingly, there is no basis for asserting the Fukuda teaches step (d) or substeps (i) and (ii).

In consideration of the preceding remarks, it should be evident that there is no basis for asserting that Fukuda anticipates Claim 1. None of the steps of this claim are disclosed or suggested by Fukuda. Therefore, the Examiner is asked to withdraw the rejection of Claim 1 over Fukuda.

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In rejecting Claim 13, the Examiner asserts that col. 1, lines 57-67 and col. 2, lines 1-2 disclose that applicants' "step of producing the data packets includes the step of ordering the data corresponding to the signal with respect to their perceptual relevance so that data having lower modulation frequencies and lower base-transform frequencies are inserted into a data packet before data having higher modulation frequencies and higher base-transform frequencies." Applicants respectfully disagree. As noted above, Fukuda fails to teach or suggest any use of data having modulation frequencies. Although Fukuda provides for ordering data on the basis of *"space frequencies"* because of the generally greater sensitivity of human vision to higher space frequencies, Fukuda does not mention, and one of ordinary skill would not be led by Fukuda to order data in data packets on the basis of *modulation frequencies*, as recited by Claim 13. Accordingly, Fukuda does not teach or suggest what is recited in Claim 13, and this rejection should be withdrawn. In addition, Claim 13 ultimately depends on Claim 1 and is patentable for at least the same reasons as it is, as discussed above.

In consideration of the preceding Remarks, it should be apparent that all claims in this application are allowable over the art of record. The Examiner is therefore requested to pass this case to issue without further delay. Should any issues remain, the Examiner is invited to telephone applicants' attorney at the number listed below.
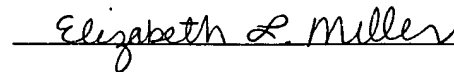
Respectfully submitted,

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RMA:elm

MAILING CERTIFICATE
I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid addressed to: Commissioner for Patents, Alexandria, VA 22313-1450, on December 9, 2005.

Date: December 9, 2005   Elizabeth L. Miller

Enclosure:
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